Crying wolf

Paul Woods takes a forward look to a time when automatic fire alarms signals can be trusted and what that might mean to the UK fire service

REMEMBER THOSE bygone days when 'world peace' was the stock answer to questions asked of Miss World contestants about what they wanted for the future. What would be the number one response to a similar question asked of chairs of fire and rescue authorities (FRAs) or chief fire officers in relation to their wishes for the future – bigger budgets, more staff, fewer fires – or perhaps a perfect model to match risk, demand and resources? The problem is, it is not that straightforward.

Risk assessment is not an absolute because data analysis will help refine the result, but there will always be a degree of subjectivity in the final equation. That, together with the area's demographics, topography and built environment, and the FRA's 'risk appetite', funding, etc, leads to an inevitable variance in and between FRA risk management plans (RMPs).

National framework

Successive national framework publications from government and local RMPs from FRAs seek to address the overarching objective of addressing foreseeable fire and rescue related community risks by optimising prevention, protection and response capabilities, once described by Denis Compton (former fire chief of Mesa, Arizona) as being a three-legged stool, with the absence of any one of those 'legs' leading to collapse of the stool (and system).

One of the perpetual problems faced by FRAs is the relative weighting and subsequent resourcing (inputs) of each of those legs, relative to outputs and outcomes achieved. Few would disagree that, if the first two are successfully applied, reliance on the third is minimised. However, until success is guaranteed (could it ever be with people in the causal mix?), a response capability will always be required, regardless of call volume.

Optimising that capability is the goal of deployment/resource modelling. A parallel exists within the health service, as does the argument that if all health promotion and illness/injury prevention strategies were successful, hospital admissions would decline and the hospital resources could be reduced or redeployed as a result, though not before getting upstream of the problem.

Within individual RMPs, authorities generally express input standards for response or attendance times to fires and other emergencies, based on the risk categorisation arrived at through the RMP process. Standards are expressed in terms of the weight of response (number of appliances) mobilised to a given incident type, together with an optimum arrival time in minutes. Response is often caveated by a 'confidence' figure for the number of occasions when this target standard will be achieved, usually in percentage terms (eg on 75% of occasions).

Life safety, as one would expect, is given priority within RMPs and response standard setting. The static and historical location of appliance bases or fire stations, in part govern the response capability of a given authority. This, coupled with the generic application of response standards – tailoring a response capability to a single postcode or super-output area being an impossibility, means there will always be an optimum geographical area below that it is not cost effective to drive resource deployment options. One of the perpetual problems for the fire and rescue service is that a fire appliance cannot usually be in two places at once and, in view of the relatively low number of incidents in any given period, predictive mobilising isn't an option.

One of the greatest and expensive assets of an FRA is its personnel and, in the majority of cases, operational personnel provide the resources that RMPs require to deliver two of those three legs of the stool – prevention and response – by giving advice to the public and responding to their emergencies. As risk and call demand drive resourcing decisions, reducing either risk or demand should in turn influence resourcing requirements.

Wish list

To return to the opening wish list question, imagine a world in which a given amount of unpredictability and a large amount of resource demand could be removed from the risk management equation at a single stoke; a world for the fire and rescue service within which more than a third of its call demand could be removed. This would give risk managers greater opportunity to allocate resources to higher priority objectives, and provide an opportunity to redefine risk and resource requirements, and ultimately deployment models.

In one particular area of fire risk management – the built environment – legislation, regulation, codes, standards and guidance inform, support and steer FRAs, building designers, owners, occupiers and others in an effort to maintain personal safety and reduce risk from fire (both its likelihood and impact). The Regulatory Reform (Fire Safety) Order 2005 [FSO] requires a risk assessment to be undertaken in non-domestic premises to determine the fire hazards present, and identify those at risk and the means for the effective

planning, organisation, control, monitoring and review of the preventive and protective measures within it.

The resultant fire protection management arrangements, adequately maintained means of escape combined with early detection and warning, reduce the risk to occupants. Early detection and warning through the provision of appropriate, well designed, installed and managed fire detection and warning systems are essential components of any fire risk management system in occupied premises.

According to the International Association of Oil and Gas Producers[1], 'fire detection and protection systems are usually classed as HSE Critical Systems'. While life safety is the primary function of such systems, the secondary tangible benefit is that of property protection, giving responders timely warning of the fire and the opportunity to provide an appropriate response capability, to effect early intervention. A significant problem, however, is that not all systems are adequately designed, installed, managed and maintained, leading to unwanted fire signals, which are a serious problem for all fire and rescue services.

False alarms

Despite efforts over a number of years by the Chief Fire Officers Association – in partnership with the Fire Industry Association, British Security Industry Association and others – to provide and support the implementation of guidance aimed at reducing false alarms and unwanted fire signals, the problem persists.

According to government figures published in May 2014, in 2012-13 fire and rescue services in Britain attended 294,800 false alarms, compared with 64,000

fires in buildings during the same period, of which 22,000 were fires in non-domestic buildings. The Building Research Establishment (BRE) has reported[2] that false alarms generated from remotely monitored fire detection and fire alarm systems cost businesses and FRAs an estimated £1 billion a year in the UK. In 2012, the BBC[3,4] reported that London Fire Brigade responded to such a call every 10 minutes at an estimated cost of £37 million a year.

For business owners and occupiers, in addition to the direct financial cost of unwanted fire signals occurring, there are associated impacts such as work flow disruption, employee distraction and potential security issues. Repeated activation of fire alarm systems can also result in employee complacency with the added risk that, in the event of a real fire occurring, evacuation may be delayed and escape jeopardised. That complacency can spill over into other situations in which those same employees find themselves – in situations or premises where a fire alarm occurs and 'déjà vu' leads to unnecessary and life-threatening delay or means of evacuation.

Unwanted impacts

For the fire and rescue service, there are a number of well-documented impacts resulting from calls and attendances to unwanted fire signals, namely:

- disruption to essential fire prevention activity or staff training
- direct costs associated with the payment of on-call firefighters who are mobilised to incidents
- diverting essential resources from genuine emergency calls
- risk to firefighters attending calls at speed
- risk to the public exposed to responding appliances
- the environmental impact of more than 500,000 appliance movements per year
- potential complacency of attending crews
- fire safety and other personnel's time lost addressing unwanted fire signals and enforcing FSO-related aspects associated with them

The direct financial implications for FRAs are clear: money spent on resources required to attend unwanted fire signals cannot be spent elsewhere to secure higher priority objectives. Every minute that a firefighter spends attending unwanted calls is time that cannot be used to provide valuable life safety information and support to communities at risk.

Consider then, the opportunity for a future in which a fire detection system does exactly what it says on the tin – detect fires! The idea that virtually each and every time a system operated, it was in response to an actual fire, would mean that occupants and firefighters would respond appropriately and in a mindset focused on dealing with an actual event. At service level, response options could be based on a weight of attack (pre-determined attendance) and operational tactics employed on arrival to address a confirmed

fire scenario. The requirement for unwanted fire signal guidance and different protocols to be applied across the UK in relation to call challenging, attendance and sanction would also be a thing of the past.

Technological advances

The development in fire detection technology has arguably outpaced its mainstream application. The use of multi-sensor, intelligent and high-integrity systems can eliminate or certainly dramatically reduce unwanted signals, as well as the direct and indirect implications listed above, and provide FRAs with the means to approach risk management afresh.

According to BRE, the use of multi-sensor detectors alone would potentially reduce the number of false alarm causes by over 69%, a substantial figure when applied to the reported 294,800 incidents in 2012-13. Multiply that by the figure quoted by the BBC[4] (provided by DCLG[5] in 2012) of £1,970 as the average cost of attendance, and the financial saving to fire and rescue services alone is a staggering £400 million!

The additional saving in opportunity cost and the potential positive impact on community risk reduction is perhaps immeasurable. Anecdotal evidence suggests the savings could be greater still with new equipment providing 80%+ true alarms, as opposed to the current performance level of 95%+ false and unwanted. In alarming upon more than one fire emission, be they combinations of smoke, heat, carbon monoxide or infrared, the incidence of false reporting on unwanted fires (smoking and toast burning) and false situations (shower steam and dust) can be significantly reduced without meaningful increases in detection time.

At a strategic level, there would be an opportunity for FRAs to review resource and response requirements within their area and inter-service, to optimise resource location and crewing requirements. Substantially reducing the disruption to programmed fire station routines caused by unwanted fire signals

would enable more robust allocation of other day-to-day management and personnel competence needs, including on and off-station training sessions, public presentations and partnership working.

At an operational level, the ability of responding officers and firefighters to mobilise and approach tactical intervention with confidence, knowing that a fire is in development, would help provide a safer working environment. To pre-plan intervention tactics and pre-determine attendances based on that same knowledge and confidence would further support operations and improve firefighter safety.

Fresh look

All this is reliant on those who design, procure, install, manage, advise and enforce fire detection systems in the built environment taking a fresh look at what is available and considering robust cost-benefit analysis, using an appropriate range of metrics to inform choice. Meeting minimum compliance standards and avoiding enforcement action are not the only things to consider when installing or refurbishing fire detection and warning systems. The introduction of intelligent, high-integrity detection systems will not solve the problem overnight, but will start an evolutionary process that in time will dramatically reduce call demand for the fire service.

Those of you interested in this kind of change are urged to lobby policy makers to introduce the requirement for all new non-domestic buildings and major refurbishments to have intelligent high-integrity detectors or multi-sensor detectors fitted as standard. You can do this by filling in the FPA Safe Futures Campaign postcard included in this issue and posting it to the minister to show your support ■

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References

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